PL9.

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,486	04/23/2001	Marc J. Beacken	5-4-2-17	2587

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Charles E. Graves Associates, P.C.
Suite 100
6818 Oasis Pass
Austin, TX 78732

EXAMINER
TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
2133	7

DATE MAILED: 04/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

		Application No.	Applicant(s)
Office Action Summary		09/839,486	BEACKEN ET AL.
		Examiner	Art Unit
		Joseph D. Torres	2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2004*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-19* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Applicant's election without traverse of Group III, claims 14-19 in Paper No. 6 is

acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

2.   Claims 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Claim 14 recites the limitation "each said codeword" in line 5. There is insufficient

antecedent basis for this limitation in the claim. The Examiner assumes the following

was intended: --each said codeword<u>s</u>--.

Claim 14 recites the limitation "said cells" in line 9. There is insufficient antecedent

basis for this limitation in the claim. The Examiner assumes the following was intended:

--said <u>memory</u> cells--

Claim 14 recites the limitation "the set of entries" in line 9. There is insufficient

antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "said repeating submatrix" in lines 12-13. There is

insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the contents" in line 16. There is insufficient antecedent

basis for this limitation in the claim.

Claim 14 recites the limitation "said submatrix" in line 17. There is insufficient

antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the encoded and interleaved data-bit stream" in line 24.

There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the medium" in line 25. There is insufficient antecedent

basis for this limitation in the claim.

Claim 15 recites the limitation "the minimum matrix dimension" in lines 2-3. There is

insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the number of successive memory references" in lines 3-

4. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "a said READ operation" in lines 4-5. The Examiner

assumes the following was intended: --a said-READ operation--.

Claim 15 recites the limitation "a said page change" in lines 5-6. The Examiner

assumes the following was intended: --a said-page change--.

The Examiner would like to point out that claim 15 needs revision since it is

nearly incomprehensible.

Claim 16 recites the limitation "a said SDRAM page" in line 6. The Examiner assumes

the following was intended: --a said-SDRAM page --.

Claim 16 recites the limitation "the READ and WRITE rates" in lines 9-10. There is

insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.   Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Boner; Alon (US 6625763 B1) in view of Roberts; Kim Byron et al. (US 6313932 B1,

hereafter referred to as Roberts).

35 U.S.C. 103(a) rejection of claim 14.

Boner teaches an apparatus and method for interleaving a transmission payload data

bit-stream to be transmitted through a free-space medium (col. 1, lines 14-20, Boner),

said apparatus comprising: means for fragmenting data into segments (Block register

301 is a means for fragmenting incoming data into 4x4 segments); a RAM buffer store

having an entry receive and transmit rate and comprising a matrix of memory cells (300

in Figure 3 of Boner is a block diagram of a RAM buffer store; Note: RAM buffer store

300 has an entry receive corresponding to the amount of time required to fill the RAM

buffer store and an entry transmit rate corresponding to the amount of time required to

read the RAM buffer store during interleaving), said RAM buffer store further having a

defined repeating x-y submatrix of said cells representing the set of entries comprising a

single RAM physical page (each row of the RAM buffer store is a defined repeating x-y

submatrix of said cells representing the set of entries comprising a single RAM physical

page); means for effecting a WRITE operation to interleave corresponding segments of

successive data into said repeating submatrix of cells (Figures 3-11 in Boner provide a

means for effecting a WRITE operation to interleave corresponding segments of

successive datawords into said repeating submatrix of cells); said WRITE operation

having an associated first page-change overhead operation (the Abstract in Boner

teaches that all write accesses are performed a row at a time, hence the WRITE

operation has an associated first page-change overhead operation corresponding to the

number of rows required for writing during interleaving), means for effecting in a READ

operation to read out the contents of said submatrix of cells (Figure 12 in Boner provide

a means for effecting a READ operation to read out the interleaved contents of said

submatrix of cells); said READ operation having an associated second page-change

overhead operation (the Abstract in Boner teaches that all read accesses are performed

a row at a time, hence the READ operation has an associated second page-change

overhead operation corresponding to the number of rows required for reading during

interleaving), said WRITE and READ operations into and out of said submatrix of cells

being conducted to substantially redistribute page change overhead operations from

said WRITE operation to said READ operation, thereby to equalize the rate of said

WRITE and READ operations (the Abstract in Boner teaches that all read and write

accesses are performed a row at a time, hence the overhead required to write data into

the RAM is substantially the same as the overhead to read the data back out); and

means for transmitting the encoded and interleaved data-bit stream of said READ

operation into said medium (col. 1, lines 14-20, Boner clearly suggests a means for

transmitting the encoded and interleaved data-bit stream of said READ operation into

said medium).

However Boner does not explicitly teach the specific use of a means for encoding an

optical transmission payload data bit-stream into codewords using Reed-Solomon

encoding for transmission in an optical free-space medium or an SDRAM buffer store.

Roberts, in an analogous art, teaches the specific use of a means for encoding an

optical transmission payload data bit-stream into codewords using Reed-Solomon

encoding for transmission in an optical free-space medium (see col. 7, lines 63-67; col.

7, lines 28-31 and col. 6, lines 49-53 in Roberts). Note: Roberts teaches a means for

encoding an optical transmission payload data bit-stream into codewords using Reed-

Solomon encoding (col. 7, lines 28-31 in Roberts) for transmission in an optical free-

space medium (col. 7, lines 63-67 in Roberts) using interleaving to guard against burst

errors (col. 6, lines 49-53 and claim 4 in Roberts), however; Roberts does not teach the

details required to interleave the Reed-Solomon codewords into interleaved Reed-

Solomon codewords as required by the Roberts patent. Boner on the other hand

teaches an interleaver for use in free-space transmissions; hence one of ordinary skill in

the art at the time the invention was made would have been highly motivated to

combine Roberts with Boner in order to implement the interleaver required to interleave

the Reed-Solomon codewords into interleaved Reed-Solomon codewords as required

by the Roberts patent. In addition, the Examiner would like to point out that SDRAM is

a type of synchronous dynamic RAM having a high bandwidth for use in high-speed

applications. One of ordinary skill in the art at the time the invention was made would

have been highly motivated to use an SDRAM embodiment of the Interleaver taught in

the Boner patent in high-speed, high-bandwidth applications such as the optical free-

space communication system taught in the Roberts patent.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify the Boner patent with the teachings of the Roberts patent

by including use of a means for encoding an optical transmission payload data bit-

stream into codewords using Reed-Solomon encoding for transmission in an optical

free-space medium and an SDRAM buffer store. This modification would have been

obvious to one of ordinary skill in the art, at the time the invention was made, because

one of ordinary skill in the art would have recognized that use of a means for encoding

an optical transmission payload data bit-stream into codewords using Reed-Solomon

encoding for transmission in an optical free-space medium and an SDRAM buffer store

would have provided the opportunity to implement the interleaver required to interleave

the Reed-Solomon codewords into interleaved Reed-Solomon codewords as required

by the Roberts patent for use in the high-speed, high-bandwidth applications in the

Roberts patent.

35 U.S.C. 103(a) rejection of claim 15.

The Abstract in Boner teaches that all read and write accesses are performed a row at a

time, hence the write operation for the buffered 4x4 segment of data in Figure 3 of

Boner requires 4 write cycles and 4 read cycles which substantially reduces the

overhead as taught in columns 1-3 whereby a 4x4 segment of data in Figure 1 of Boner

requires 4 write cycles and 12 read cycles. Note: use of buffered 4x4 segments

whereby data is read accessed a row at a time is a means for dimensioning said

submatrix of cells for reading such that the minimum matrix dimension representing the

number of successive memory references that occur before a page change during a

said READ operation is sufficient to amortize SDRAM overhead for a said read page

changes.

35 U.S.C. 103(a) rejection of claim 16.

Boner teaches an apparatus for WRITING into successive columns of said submatrix

cells corresponding segments of successive said codewords comprising a said SDRAM

page (col. 6, lines 24-38 in Boner teach write register 301 in Figure 3 of Boner is an

apparatus for WRITING into successive columns of said submatrix cells corresponding

segments of successive said codewords comprising a said SDRAM page); and

apparatus for remapping submatrix cell addresses for READout to maintain the number

of columns held on one page to a number that ensures a physical SDRAM page change

at intervals which makes the READ and WRITE rates substantially equal (read register

1202 in Figure 12 of Boner is an apparatus for remapping submatrix cell addresses for

READout to maintain the number of columns held on one page to a number that

ensures a physical SDRAM page change at intervals which makes the READ and

WRITE rates substantially equal).

4.   Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Boner; Alon (US 6625763 B1) and Roberts; Kim Byron et al. (US 6313932 B1, hereafter

referred to as Roberts) in view of Takeuchi; Yoshio et al. (US 5907563 A, hereafter

referred to as Takeuchi).

35 U.S.C. 103(a) rejection of claim 17.

Boner and Roberts substantially teaches the claimed invention described in claims 14-

116 (as rejected above).

However Boner and Roberts do not explicitly teach the specific use of a means for

sensing conditions in said medium which cause scintillation effects; and means for

activating said encoding and interleaving steps when said conditions are detected.

Takeuchi, in an analogous art, teaches a means for sensing conditions in said medium

which cause scintillation effects (the Abstract and col. 4, lines 3-14 in Takeuchi teaches

monitoring statistical information that includes burst length; Note: monitoring statistical

information that includes burst length is a means for sensing conditions in said medium

which cause scintillation effects since bursts length is a measure of scintillation effects);

and means for activating said encoding and interleaving steps when said conditions are

detected (the Abstract in Takeuchi teaches an error control means for activating said

encoding and interleaving steps when said conditions are detected).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to modify Boner and Roberts with the teachings of Takeuchi by

including use of a means for sensing conditions in said medium which cause scintillation

effects; and means for activating said encoding and interleaving steps when said

conditions are detected. This modification would have been obvious to one of ordinary

skill in the art, at the time the invention was made, because one of ordinary skill in the

art would have recognized that use of a means for sensing conditions in said medium

which cause scintillation effects; and means for activating said encoding and

interleaving steps when said conditions are detected would have provided the

opportunity to optimize data throughput while maintaining an acceptable level of error

correct capabilities to ensure data integrity.

35 U.S.C. 103(a) rejection of claim 18.

See Fig. 1 in Takeuchi.

35 U.S.C. 103(a) rejection of claim 19.

Boner, Roberts and Takeuchi substantially teaches the claimed invention described in

claim14-18 (as rejected above).

However Boner, Roberts and Takeuchi do not explicitly teach the specific use of a the specific data, block and code sizes as recited in the Applicant's claim 19.
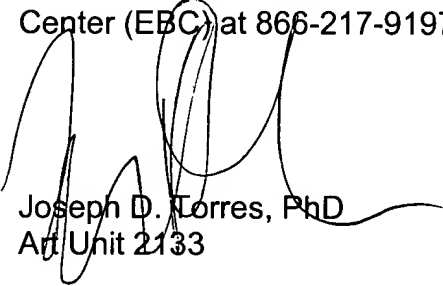
The Examiner asserts that the specific data, block and code sizes as recited in the Applicant's claim 19 is an obvious embodiment of the teaching in Boner, Roberts and Takeuchi patent based on obvious engineering design requirements for a particular transmission media.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Boner, Roberts and Takeuchi patents by including use of a the specific data, block and code sizes as recited in the Applicant's claim 19. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a the specific data, block and code sizes as recited in the Applicant's claim 19 would have provided the opportunity to implement the teachings of the Boner, Roberts and Takeuchi patents in an environment for which the teachings of the Boner, Roberts and Takeuchi patents were designed for based on obvious engineering design requirements for a particular transmission media.

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD
Art Unit 2133